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Big Thorne Project
Thorne Bay Ranger District, Tongass National Forest

Final Environmental Impact Statement

Volume I

ACRONYMS AND ABBREVIATIONS

ACHP Advisory Council on Historic Preservation
ACMP Alaska Coastal Management Program
ADCCED Alaska Department of Commerce, Community, and Economic Development
ADEC Alaska Department of Environmental Conservation
ADF&G Alaska Department of Fish and Game
ADNR Alaska Department of Natural Resources
AHMU Aquatic Habitat Management Handbook
ANCSA Alaska Native Claims Settlement Act (1972)
ANILCA Alaska National Interest Lands Conservation Act (1980)
ARD Acid Rock Drainage
ASQ Allowable Sale Quantity
ATM Access Travel Management Plan
BA Biological Assessment
BE Biological Evaluation
BMP Best Management Practice
CA Census Area
CEQ Council on Environmental Quality
CERCLA Comprehensive Environmental Response, Compensation and Liability Act
CFR Code of Federal Regulations
CMAI Culmination of Mean Annual Increment
CMT Cultural Modified Tree
CO_2 Carbon Dioxide
Corps United States Army Corps of Engineers
CZMA Coastal Zone Management Act (1972)
DBH Diameter (of a tree) at Breast Height (about 4.5 feet high)
DPS Distinct Population Segment
EIS Environmental Impact Statement
EFH Essential Fish Habitat
EO Executive Order
EPA Environmental Protection Agency
ESA Endangered Species Act
ESI Existing Scenic Integrity
EVC Existing Visual Conditions
FASTR Financial Analysis Spreadsheet Tool - RV
FEIS Final Environmental Impact Statement
Forest Service United States Department of Agriculture, Forest Service
FSH Forest Service Handbook
FSL Forestry Sciences Laboratory
FSM Forest Service Manual
GIS Geographic information system
GMU Game Management Unit
GPS Global Positioning System
HIS Habitat Suitability Index
HUC Hydrologic Unit Code
IDT Interdisciplinary Team
IRA Inventoried Roadless Area
ISLES Island Surveys to Locate Endemic Species
LSTA Logging system and transportation analysis
LTF Log Transfer Facility
LUD Land Use Designation
LWD Large Woody Debris
MAF Marine Access Facility
MBF Thousand Board Feet
MIS Management Indicator Species
ML Maintenance Level
MMBF Million Board Feet
MMI Mass Movement Index
MOU Memorandum of Understanding
NAWS Non-agricultural Wage and Salary
NEPA National Environmental Policy Act
NFMA National Forest Management Act (1976)
NFS National Forest System
NHPA National Historic Preservation Act
NMFS National Marine Fisheries Service
NOI Notice of Intent
NPDES National Pollutant Discharge Elimination System
NRHP National Register of Historic Places
OBML Objective Maintenance Level
OGR Old-growth Reserve
OHV Off-highway vehicle
OPML Operational Maintenance Level
OPMP Office of Management and Permitting
PCT Pre-commercial Thinning
PFC Proper Functioning Condition
PNW Pacific Northwest Forest and Range Experiment Station
POG Productive Old Growth
POW Prince of Wales
RAP Roads Analysis Process
RARE II Roadless Area Review and Evaluation
RAW Reasonable Assurance of Windfirmness
RCS Road Condition Survey
RM Roaded Modified
RMA Riparian Management Area
RMO Road Management Objective
RN Roaded Natural
RNA Research Natural Area
ROD Record of Decision
ROS Recreation Opportunity Spectrum
SDM Size Density Model
SEIS Supplemental Environmental Impact Statement
SHPO State Historic Preservation Office
SIO Scenic Integrity Objective
SMS Scenery Management System
SPM Semi-Primitive Motorized
SPNM Semi-Primitive Non-Motorized
TAP Travel Analysis Process
TCRA Time Critical Removal Actions
TES Threatened, Endangered, Sensitive (species)
TTRA Tongass Timber Reform Act (1990)
U Urban
USDA United States Department of Agriculture
USGS United States Geological Survey
USFWS United States Fish and Wildlife Service
VAC Visual Absorption Capability
VCU Value Comparison Unit
VPR Visual Priority Route
VRM Visual Resource Management
WAA Wildlife Analysis Area
WIT Watershed Inventory Tracking
WRP Watershed Restoration Plan
WSRA Wild and Scenic Rivers Act

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Dear Planning Participant:

Here is your copy of the Final Environmental Impact Statement (FEIS) for the Big Thorne Project on the Thorne Bay Ranger District, Tongass National Forest. This EIS analyzes four action alternatives and a no-action alternative. The action alternatives would make available for harvest between about 84.4 to 175.7 million board feet (MMBF) of sawlog plus utility timber volume, and proposes 0.2 to 13.9 miles of new NFS road construction, 11.2 to 37.5 miles of temporary road construction, and 17.5 to 36.7 miles of road reconstruction. Proposed harvest systems include both clearcutting and single-tree or group selection, and proposed logging systems include both conventional and helicopter.

The significant issues addressed by the alternatives include timber supply and timber sale economics, old-growth habitat LUD modifications, wildlife habitat and subsistence use, and cumulative watershed effects.

Also analyzed is a proposal for a non-significant amendment to the Forest Plan that would modify the location of some small old-growth reserves. The Record of Decision will document my final decision on the Selected Alternative and the facts considered in reaching the decision. The effective date of implementation of the decision and the notice of rights of appeal will also be specified in the ROD.

Copies of the Final EIS have been directly mailed to those people who requested to be on the project mailing list. Copies of this Final EIS area also available for review at Forest Service offices throughout the Tongass and online at:
http://www.fs.fed.us/r10/tongass/projects/projects.shtml

For additional information, please contact the Thorne Bay Ranger District at 907-828-3220 during regular business hours, Monday-Friday, 8 am to 4:30 pm.

Sincerely,

FORREST COLE
Forest Supervisor

Big Thorne Project

Final Environmental Impact Statement

United States Department of Agriculture, Forest Service Alaska Region

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Abstract: The Forest Service proposes to harvest timber, build new roads, and reconstruct roads in the Big Thorne project area on north-central Prince of Wales Island. The project area includes the community of Thorne Bay and is adjacent to Coffman Cove. The actions analyzed in this EIS are designed to implement the Tongass Land and Resource Management Plan (Forest Plan). The EIS describes and analyzes in detail five alternatives, which provide differing outputs and responses to the issues identified for this project. None of the alternatives include entry into inventoried roadless areas.

Alternative 1 (No Action) proposes no harvest or roadbuilding activities in the project area at this time. Current and on-going management activities would continue.

Alternative 2 (Proposed Action) proposes to harvest about 121 MMBF of timber on about 5,121 old-growth acres, build 32 miles of National Forest System (NFS) and temporary road and reconstruct 18 miles of NFS road. No commercial thinning is included.

Alternative 3 proposes to harvest about 176 MMBF of timber on about 7,120 old-growth and 2,299 young-growth acres, build 51 miles of NFS and temporary road and reconstruct 37 miles of NFS road. The young growth will be commercially thinned.

Alternative 4 proposes to harvest about 84 MMBF of timber on about 4,757 old-growth and 1,888 young-growth acres, build 11.5 miles of NFS and temporary road and reconstruct 19 miles of NFS road. The young growth will be commercially thinned.

Alternative 5 proposes to harvest about 114 MMBF of timber on about 5,452 old-growth and 1,850 young-growth acres, build 17 miles of NFS and temporary road and reconstruct 17.5 miles of NFS road. The young growth will be commercially thinned.

SUMMARY

Introduction

The Forest Service has prepared this Final Environmental Impact Statement (Final EIS) to analyze the potential impacts of timber harvesting and road management in the Big Thorne project area. This Final EIS is in compliance with the National Environmental Policy Act 42 U.S.C. 4321 et seq. (NEPA), the National Forest Management Act of 1976, and all other relevant Federal and State laws and regulations.

Project Area

The Big Thorne project area is located in Southeast Alaska on Prince of Wales Island, around the community of Thorne Bay and south of Coffman Cove (see Figure 1-1) and covers approximately 232,000 acres of lands, including about 14,000 acres of State and private lands (non-National Forest System [NFS]) and 218,000 acres of NFS lands. Three land use designations (LUDs) comprise 84 percent of the project area; these consist of Old-Growth Habitat, Timber Production, and Modified Landscape, in descending order of abundance. The Scenic River LUD along the Thorne River-Hatchery Creek system also comprises significant acreage. The remaining LUDs consist of Scenic Viewshed, Recreational River, Research Natural Area, and miscellaneous small acreages. Combined, the three primary timber management LUDs (Timber Production, Modified Landscape, and Scenic Viewshed) comprise about 124,000 of the 218,000 acres of NFS lands in the project area. A fairly extensive road system already exists and an operating medium-sized sawmill exists on the island along with numerous small mills.

These conditions make the area more likely to produce economic and long-term sales. Longer-term sales are the best way to provide sufficient assurance of timber supply to support the necessary investment in new and upgraded manufacturing facilities by the timber industry.

In implementing Forest Plan direction in accordance with the Council of Environmental Quality regulations (40 CFR 1500-1508), this Final EIS answers the following eight questions:

1 – What action is proposed?

The proposed action for the Big Thorne Project is to harvest timber on approximately 5,121 acres of forested lands using various sizes of timber sales, offered over multiple years, within the roaded land base on Prince of Wales Island. This harvest would include approximately 593 acres in Phase 2 lands of the Tongass Timber Sale Program Adaptive Management Strategy (USDA Forest Service 2008b), which would be reserved for small timber sales. These Phase 2 lands are included because they are not roadless and are very close to Thorne Bay. Approximately 32 miles of NFS and temporary roads would be constructed and about 18 miles of existing roads would be reconstructed. No harvest or road construction/reconstruction would occur within Inventoried Roadless Areas (IRAs). An estimated 105 million board feet (MMBF) of sawtimber and 16 MMBF of utility

volume could be made available to industry for harvest. Existing log transfer facilities would be used as needed. Harvest would include helicopter, ground-based, and cable yarding systems and would include even-aged and uneven-aged harvest prescriptions to achieve stand objectives. The proposed action and the action alternatives would meet the standards and guidelines and accomplish the goals and objectives of the Tongass National Forest Land and Resource Management Plan (Forest Plan) (USDA Forest Service 2008a).

Site-specific descriptions and resource considerations for each potential harvest unit were included as unit cards in Appendix B of the Draft EIS; updated unit cards for the Final EIS are located in the project record and cards will be included with the Record of Decision (ROD) for the selected alternative. All roads have been located and will be designed to avoid or minimize effects on wetlands. Resource considerations for each proposed new system road were included in the road cards in Appendix C of the Draft EIS; updated road cards for the Final EIS are located in the project record and cards will be included with the ROD for the selected alternative (40 CFR 1502.4(a); 1508.23; 1502.14; and 1502.5).

2 – Why is the project being proposed?

The Big Thorne Project is proposed at this time to respond to goals and objectives of the Forest Plan (USDA Forest Service 2008a), to help move the project area toward the desired conditions described in that plan, and to meet the needs of Southeast Alaska timber operators and residents. The Forest Plan includes both forest-wide goals and objectives and area-specific (LUD) goals, objectives, and desired conditions. The Big Thorne Project would respond to the following Forest Plan goals and objectives:

Timber—Goal (USDA Forest Service 2008a, 2-7)

- Provide for the continuation of timber uses and resources by the timber industry and Alaska residents.

Timber—Objectives (USDA Forest Service 2008a, 2-7)

- Seek to provide an economic timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the market demand for the planning cycle, up to a ceiling of this Plan's allowable sale quantity, which is 2.67 billion board feet in the first decade.
- Manage young growth to improve habitat for wildlife and commercial timber products.
- Provide 2-3 years supply of volume under contract to local mills and then establish shelf volume to maintain flexibility and stability in the sale program.
- Review the timber sale program and work with State and other partners to implement changes that will keep an "economic timber" perspective throughout the process and monitor the implementation of these reforms to ensure they are consistently employed across the Forest.

Local and Regional Economy—Goal (USDA Forest Service 2008a, 2-5)

- Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.

Local and Regional Economy—Objective (USDA Forest Service 2008a, 2-5)

- Support a wide range of natural resource employment opportunities within Southeast Alaska communities.

Seeking to meet timber demand for the Tongass National Forest is required by Section 101 of the 1990 Tongass Timber Reform Act (TTRA) which states that, "...to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest.." The interdisciplinary team (IDT) for the Big Thorne project found that the timber resources in the project area have potentially high value for local economies.

Southeast Alaska, and locally the Prince of Wales Island area, has experienced a significant decline in timber industry employment, with employment dropping sharply in the 1990s, following the closure of the region's two pulp mills, and continuing to decrease over the past decade. This decline has been mirrored by a decline in regional sawmill production and reduced harvest levels Forest-wide. Allowing the use of renewable timber resources would provide Southeast Alaska timber operators with the opportunity to generate and support jobs and income in the region (see Issue 1 – Timber Supply and Economics in Chapter 1 and Chapter 3).

In addition, given the relevant Forest Plan goals and objectives and based on analysis of existing conditions in the project area, the interdisciplinary team found that the roaded landscape, tree species composition, and tree quality of the Big Thorne project area provides opportunity for economic timber harvest. Further, because of its central location on the Prince of Wales Island road system, the Big Thorne project area has economic transportation connections to the largest active sawmill and one of the highest concentrations of small operators in Southeast Alaska. Therefore, the Big Thorne project is proposed at this time to respond to the underlying need for a reliable, economic, and long-term timber supply, as well as to respond to the goals and objectives identified for the project area by the Forest Plan and to move the project area toward the desired condition described in the Forest Plan.

The purpose of and need for project action is further explained in Chapter 1 and in greater detail in Appendix A of this document (40 CFR 1502.13).

3 – Alternatives: What other action would meet the same need?

The proposed action, three action alternatives, and a "No Action" alternative have been analyzed in detail. Each action alternative provides a different response to key issues while still meeting the stated purpose and need of this EIS. Each of these action alternatives represents a site-specific proposal developed through an intensive, field-verified, interdisciplinary team evaluation of timber harvest unit and road design.

All action alternatives to the proposed action are consistent with the Forest Plan. All applicable Forest Plan Standards and Guidelines have been incorporated into the design of the proposed units and alternatives. While some alternatives have been designed to provide a greater measure of protection than is required by the Forest Plan for some resources (e.g., spreading out units and modifying prescriptions to reduce effects on

wildlife in Alternative 4), all alternatives were designed to meet Forest Plan Standards and Guidelines for all other resources. Additional direction comes from applicable laws and Forest Service manuals and handbooks. Each alternative complies with the Tongass Conservation Strategy designed to ensure the maintenance of viable populations of all vertebrate species on the Tongass by means of a comprehensive approach based on principles of conservation biology (see Issue 3 – Wildlife and Subsistence Use in Chapter 3). Forest Plan Standards and Guidelines for riparian areas are applied to all streams within the project area.

The following is a brief discussion of how the alternatives respond to the key issues identified for the Big Thorne project. A detailed comparison of these issues by project alternative is summarized in Chapter 2, and a full examination of effects of each alternative relative to key issues as well as other resource concerns is provided in Chapter 3. None of the action alternatives include harvest or road construction in IRAs.

Alternative 1

Alternative 1 is the No Action Alternative in the EIS. Under this alternative, no timber harvest or road building would take place at this time. As a result, this alternative would not meet the purpose and need for the project.

Alternative 2

Alternative 2 (see "1 – What action is proposed?") addresses Issue 1 – Timber Supply and Sale Economics, while limiting effects on other issues and resources. It completely avoids harvest or road construction in IRAs. Alternative 2 would meet the purpose and need for the project.

It would produce 105 MMBF of sawtimber plus 16 MMBF of utility volume (121 MMBF total volume) by harvesting 5,121 acres of old growth, building 32 miles of new roads (including formerly decommissioned roads), and reconstructing 18 miles of stored roads. About 8 miles of the new roads would be NFS roads; the remaining new roads would be temporary roads.

Alternative 3

This alternative gives greatest priority to Issue 1 by emphasizing timber production and addressing timber sale economics. As such, it maximizes the amount of cable and shovel clearcut prescriptions among the alternatives, and includes commercial thinning of 50+ year-old stands. This alternative also adjusts the boundaries of small old-growth reserves (OGRs) outside of IRAs so that more of these OGRs would be placed inside IRAs and the vacated roaded portions would be designated as Timber Production or Modified Landscape and made available for timber management. It completely avoids harvest or road construction in IRAs. Alternative 3 would meet the purpose and need for the project.

It would produce 155 MMBF of sawtimber and 21 MMBF of utility volume (176 MMBF total volume) by harvesting 7,120 acres of old growth, 2,299 acres of young-growth thinning, building 51 miles of new roads (including formerly decommissioned roads), and reconstructing 37 miles of stored roads. About 14 miles of the new roads would be NFS roads; the remaining new roads would be temporary roads.

Alternative 4

The primary objective of Alternative 4 is to address Issues 2 and 3, by maintaining landscape connectivity, protecting important wildlife corridors, and reducing impacts to sensitive plants and wildlife. Under this alternative, impacts to biodiversity and wildlife were minimized by selecting harvest methods and prescriptions that would have a lighter touch on the landscape (i.e., resulting in less old-growth removal and less road construction); deferring or modifying boundaries of proposed units that could impact habitat connectivity or impact sensitive plant populations; and positioning legacy forest structure requirements to protect important wildlife habitats.

This alternative also adjusts the boundaries of small OGRs by incorporating the biologically preferred alternative based on an interagency review of small OGRs. Areas vacated by small OGR modifications would be designated as Timber Production or Modified Landscape and made available timber harvest. It completely avoids harvest or road construction in IRAs. Alternative 4 would meet the purpose and need for the project.

Alternative 4 would produce about 75 MMBF of sawtimber and 10 MMBF of utility volume (84 MMBF total volume) by harvesting 4,757 acres of old growth, thinning 1,888 acres of 50+ year-old young growth, building 11.5 miles of new roads (including formerly decommissioned roads), and reconstructing 19 miles of stored roads. Only 0.2 mile of the new roads would be NFS roads; the remaining new roads would be temporary roads.

Alternative 5

Alternative 5 addresses watershed effects (Issue 4) and other issues raised by minimizing road construction, road-stream crossings, reducing cable or shovel logging, and reducing harvest in watersheds with high levels of harvest within the past 30 years. This alternative increases harvest volume by including commercial thinning units in young-growth stands 50 years of age or older to benefit watershed function. It completely avoids harvest or road construction in IRAs. Alternative 5 would meet the purpose and need for the project.

This alternative would produce about 101 MMBF of sawtimber and 13 MMBF of utility volume (114 MMBF total volume) by harvesting 5,452 acres of old growth, thinning 1,850 acres of 50+ year-old young growth, building 17 miles of new roads (including formerly decommissioned roads) and reconstructing 17.5 miles of stored roads. Only 0.8 mile of the new roads would be NFS roads; the remaining new roads would be temporary roads.

4 – What would it mean not to meet the need for project action?

Not meeting the need for timber production in the project area would mean that Forest Plan requirements for continuous yield of timber would have to be met in other areas (see Appendix A – Reasons for Scheduling the Environmental Analysis of the Big Thorne Project). Harvest from micro-sales would continue to occur in the Big Thorne project area if this project does not go forward. However, harvest in this manner does not include a landscape-level approach, does not provide a balanced view of resource needs, and would contribute only a minimal amount of wood fiber to the local and regional economies of Southeast Alaska. In the absence of a long-term (i.e., multi-year) stable supply of

economic timber from the Big Thorne Project or elsewhere, the future viability of existing mill operators on Prince of Wales Island and elsewhere in the region would be adversely affected (see Issue 1 – Timber Supply and Economics in Chapter 3) (40 CFR 1508.25(b)(1); and 1502.14(d)).

5 – What are the effects of the proposed action, and alternative actions — in comparative format?

The following four issues were determined to be potentially key or significant and within the scope of the project decision. The IDT developed the alternatives to the proposed action to address these issues. Chapter 2, Alternatives, introduces how the alternatives meet the purpose and need for the project, and compares outputs, objectives and effects of the alternatives in terms of the key issues (see Table 2-1, Comparison of Alternatives by Issue). Chapter 3 examines the existing condition and analyzes the effects or consequences of the project as it relates to these issues. The following summarizes these effects:

ISSUE 1 – Timber Supply and Timber Sale Economics

Each of the four action alternatives is designed to be responsive to the need for a reliable, economic supply of sawtimber to meet market demand. These alternatives also have the potential to support timber industry employment and benefit local and regional economies. Alternative 3 would produce the largest volume of timber, followed by Alternatives 2, 5, and 4 in that order. Assuming constant job/MMBF ratios, the alternatives with more volume would have a higher potential to support employment and income in local economies. Total estimated direct employment ranges from 341 to 386 jobs (annualized job-years) under Alternative 4 to 706 to 816 jobs under Alternative 3, reflecting the relative volumes that would be made available under each alternative. The project would also support indirect jobs within the region.

For timber volume to contribute to the stated purpose, it must also be economically viable. Current indicated bid values are positive for three of the four action alternatives, ranging from about $7/MBF under Alternative 5 to $58/MBF under Alternative 2, the proposed action. The indicated bid value for Alternative 4 is negative at -$13/MBF under current economic assumptions. The quantity of economically viable timber volume available at project implementation would depend on a number of factors. Changes in regional and global timber markets and other factors such as fuel costs can dramatically affect stumpage values and logging costs at the time of implementation and harvest. The full economic benefits of a given alternative may not be available under poor market conditions.

Under Alternative 1 (No Action), there would be no timber volume available for sale through the Big Thorne Project. The project would not meet the purpose and need, which is to contribute to a supply of economic timber to industry on Prince of Wales Island and Southeast Alaska, in general (including both large and small operators), in a manner that is consistent with the multiple-use goals and objectives of the Tongass Forest Plan. The Big Thorne project is intended to provide a supply of economic timber and designed to include sufficient units and volume to allow the Forest Service to adjust future timber sale

offerings from the project area to meet fluctuating market conditions, to the extent possible.

A stable and economic timber supply is intended to support local operators and encourage investment in the wood products industry as it transitions to include more young-growth harvesting and restoration activities. Timber from the Big Thorne project would represent a portion of the timber supply available to Southeast Alaska's economy. A stable timber supply in Southeast Alaska depends on the success of many timber sales across the forest. As noted above, in the absence of a long-term (i.e., multi-year) stable supply of economic timber from the Big Thorne project or elsewhere, the future viability of existing mill operators would be adversely affected. Closure of one or more of the existing mills would result in a reduction in direct jobs and could also affect local businesses that support the sawmill sector.

ISSUE 2 – Old-growth Habitat LUD Modifications

Modifications to small old-growth reserves (OGRs) are proposed under Alternatives 3 and 4. Alternative 3 would exchange roaded portions of small OGRs (making these acres available for timber harvest) for substitute acres in IRAs. Alternative 4 would modify the current locations of small OGRs so that they correspond with biologically preferred locations, as identified by an interagency OGR review team. Alternatives 1, 2, and 5 would not modify small OGR boundaries.

Both Alternatives 3 and 4 would result in a net gain in OGR acres (590 acres in Alternative 3 and 4,270 acres in Alternative 4); however, Alternative 3 would reduce the total amount of POG in small OGRs by 843 acres, while Alternative 4 would increase the total amount of POG in small OGRs by 2,029 acres. Alternative 3 would increase the amount of suitable forest land available for timber production by 1,174 acres and Alternative 4 would reduce suitable and available forest land by 1,451 acres.

All existing and modified small OGRs would be consistent with Forest Plan acreage requirements. About half of the small OGR modifications under Alternative 3 would result in a tradeoff between a reduction in the amount of roads and early seral forest included in small OGRs for a reduction in the amount of POG habitats (e.g., deer winter range, goshawk and marbled murrelet nesting habitat, and low elevation old-growth), and sometimes a decrease in areas important for connectivity, included in the OGRs. Modifications in all small OGRs under Alternative 3 would increase the timber available to the Big Thorne project. Generally, small OGR modifications under Alternative 4 would increase inclusion of POG habitats in the OGRs and encompass important travel corridors, while decreasing forest land available for timber production.

ISSUE 3 – Wildlife and Subsistence Use

Alternative 1 (No Action) would have no direct, indirect, or cumulative effects on wildlife or subsistence use that are associated with the Big Thorne Project. All action alternatives would result in a decrease in productive old-growth (POG) habitat, resulting in a reduction of 5 to 7 percent from current amounts within the project area. Resulting impacts to biodiversity and landscape connectivity (fragmentation) would be greatest under alternatives that harvest the most POG. However, impacts would be reduced under alternatives that incorporate more uneven-aged harvest prescriptions. Likewise, impacts

would be less under alternatives that incorporate more helicopter logging than conventional logging systems. Based on acres of POG harvested, the increase in number of POG patches, and the proportion of harvest that would be uneven-aged, Alternative 3 would have the greatest adverse effects to biodiversity, followed by Alternatives 2, 5, 4, and 1.

Reductions in POG would reduce habitat available for marten, goshawks, Prince of Wales flying squirrel, snag-dependent species (red-breasted sapsucker, hairy woodpecker, and brown creeper), spruce grouse, endemic species, migratory birds, and other old-growth associated species. Habitat for these species is maintained by Forest Plan standards and guidelines, riparian buffers, beach and estuary fringe, OGRs, other non-development LUDs, and other aspects of the Forest Plan conservation strategy. Local reductions in populations may occur for these species, either through disturbance, habitat removal, or fragmentation (reduced dispersal and/ or population isolation), under all action alternatives.

Removal of low elevation POG under all alternatives would reduce the amount of available deer winter habitat, and thus would reduce deer habitat capability. Currently, deer habitat capability in all of the Wildlife Analysis Areas (WAAs) coinciding with the project falls below the Forest Plan standard of 18 deer per square mile considered necessary to maintain a sustainable wolf population and meet human harvest demands. Further reductions in deer habitat capability resulting from the action alternatives may result in local declines in the deer population, reducing the number of deer available to wolves and subsistence hunters. Although wolves are highly mobile within their territories and some nearby WAAs with higher deer densities would continue to support wolves in the vicinity of the project, wolf mortality has been identified as a concern in project area WAAs.

All action alternatives would increase road density. Current road densities in all the WAAs coinciding with the project are higher than the Forest Plan recommended threshold of 0.7 to 1.0 mile per square mile for areas where wolf mortality has been identified as a concern. Resulting total road densities (NFS and non-NFS lands) range from 1.7 to 2.8 miles per square mile depending on the WAA and alternative. Increased road density indirectly affects wolves, as well as other harvested species (marten and black bears), by increasing human access which may lead to increased harvest rates.

ISSUE 4 – Cumulative Watershed Effects

Alternative 1 (No Action) would have no direct, indirect, or cumulative watershed effects associated with the Big Thorne Project. All action alternatives would result in minor (effects would be measurable, with only small, localized changes to the site, lasting less than a week) to moderate (effects would be measurable at the stream reach or subwatershed scale, and last more than a week) effects on sedimentation and aquatic habitat. Alternative 3 would have the most effects, followed by Alternative 2. Compared to Alternatives 2 and 3, Alternative 4 would have less effect on sedimentation and aquatic habitat. Compared to Alternative 5, Alternative 4 would have less harvest, less new road construction, more reconstruction of ML1 stored roads, and more road-stream crossings (Class I, II, and III), resulting in similar but slightly less effects on sedimentation and aquatic habitat than Alternative 5. Alternative 5 would construct slightly more road miles

than Alternative 4, but substantially less road miles than Alternatives 2 or 3, and have the fewest road-stream crossings (Class I, II, and III) of all the alternatives (40 CFR 1502.14;1508.8;1502.16).

6– What factors will be used when making the decision among alternatives?

The factors that will influence the decision among alternatives include design and location of timber harvest, road construction and reconstruction, social and economic factors: see Issue 1 - Timber Supply and Sale Economics; Issue 2 – Old-Growth Habitat LUD Modifications; Issue 3 – Wildlife Habitat and Subsistence Use; Issue 4 – Cumulative Watershed Effects; and other resource concerns (also see the section Decision Framework in Chapter 1) (40 CFR 1502.23).

7 – Are there any ways to mitigate adverse effects?

Possible adverse impacts may occur from implementing the actions proposed under each alternative. Measures have been formulated to mitigate or reduce these impacts, guided by direction in the Forest Plan. Entire units and partial units have been deleted from further consideration so that impacts can be avoided, because of resource concerns. Adverse effects, such as risks from windthrow to standing timber after harvest, have been evaluated, and means to minimize windthrow, such as windfirm buffers, are incorporated into all harvest unit prescriptions, where needed. If any previously undocumented goshawk nests are discovered at any time prior to or during the implementation of this project, the appropriate protection measures (nest buffers) would be enacted.

Resource specialists from the ID Team used on-the-ground inventories, computer (GIS) data, and aerial photographs to prepare unit cards (Appendix B in the Draft EIS; unit cards for the Final EIS are in the project record) for each harvest unit in the unit pool for the project, and road cards (Appendix C in the Draft EIS; road cards for the Final EIS are in the project record for each segment of road). The cards describe site-specific concerns, and how these concerns would be mitigated or avoided in the design of each unit and road segment.

Resource concerns and mitigation measures may be refined further during final layout, when specialists have another opportunity to refine their unit and road card recommendations.

Some general mitigation common to all alternatives is described in Chapter 2. A more detailed discussion by issue and resource is in Chapter 3 (40 CFR 1508.25(b)(3); 1502.14(f);1502.16(h); 1508.20; and 1500.2(e)).

8 – What monitoring is necessary?

Routine implementation monitoring is part of the administration of a timber sale contract. The sale administrators and road inspectors ensure that the prescriptions contained on the unit and road cards, and the unit silvicultural prescriptions, are incorporated into contract documents; they then monitor performance relative to contract requirements. The unit cards and road cards for the Final EIS alternatives are located in the project record; the Draft EIS unit and road cards were included in Appendices B and C of the Draft EIS,

respectively. Input by resource staff specialists, such as fisheries biologists, soil scientists, hydrologists, and engineers, would be regularly requested during this implementation monitoring process. These specialists provide technical advice when questions arise during project implementation.

Tongass National Forest staff annually conducts a review of Best Management Practice (BMP) implementation and effectiveness. The results of this and other monitoring are summarized in a Tongass National Forest Annual Monitoring and Evaluation Report. This report provides information about how well the management direction of the Forest is being carried out and measures the accomplishment of anticipated outputs, activities and effects.

Final EIS Organization

This Final EIS discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. All numbers in this document are approximate. The document is organized into four chapters:

- Chapter 1 explains the purpose and need for the proposed action, discusses how the Big Thorne Project relates to the Forest Plan, and identifies the significant, or key, issues driving the EIS analysis.
- Chapter 2 describes the proposed action, compares alternatives to the proposed action including a No-action Alternative, and summarizes the significant environmental consequences by issue.
- Chapter 3 describes the natural and human environments potentially affected by the proposed action and alternatives, and discloses what potential effects are anticipated.
- Chapter 4 contains the list of preparers, the Final EIS distribution list, literature cited, a glossary, and an index.
- Appendices provide additional information on specific aspects of the proposed project.

Copies of this Final EIS may be obtained from the Thorne Bay Ranger District office at Thorne Bay, Alaska. Additional documentation, including more detailed analyses of project area resources, may be found in the project record located at the Thorne Bay Ranger District office.

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